

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): An object detector comprising:

an antenna irradiating an electric wave to a first detection region and receiving its echo;

control means for switching a beam width and/or a beam direction of the antenna and scanning a plurality of additional detection regions such that one of the detection regions overlaps at least another one ~~any one~~ of other detection regions;

detecting means for detecting whether a detection object exists in each of the detection regions ~~or not~~ based on the received echo; and

bearing specifying means for narrowing down a bearing in which the detection object exists based on detection results of the first and additional ~~plural~~ detection regions.

Claim 2 (previously presented): The object detector according to claim 1, wherein the bearing specifying means narrows down the bearing in which the detection object exists based on both detection results of the detection regions where the object was detected, and the detection results of the detection regions in which the object was not detected.

Claim 3 (previously presented): The object detector according to claim 2, wherein the bearing specifying means specifies a region provided by excluding a region corresponding to sum of sets of the detection regions where the object was not detected,

from a region corresponding to product set of the detection regions where the object was detected, as a bearing in which the object exists.

Claim 4 (currently amended): The object detector according to claim 3, wherein the bearing specifying means assigns, for each detection region, a logical value based on ~~treats~~ information identifying whether the detection object exists in the detection region, ~~or not with a logical value~~, and calculates the bearing region provided by excluding the detection regions ~~corresponding to the sum of sets of the detection regions~~ where the object was not detected, from the detection regions ~~corresponding to the product set of the detection regions~~ where the object was detected[[,]] using logical operations[[.]] upon the logical values.

Claim 5 (currently amended): The object detector according to ~~any one of~~ claim[[s]] 1, wherein the bearing specifying means specifies the bearing in which the object exists, after detection results are obtained for referring to the predetermined plural detection regions.

Claim 6 (currently amended): The object detector according to ~~any one of~~ claim[[s]] 1, wherein ~~the control means repeats scanning for a set of detection regions by which the whole regions corresponding to the sum of sets of all detection regions can be scanned, with the least number of scanning, among the predetermined plural detection regions; and when the object is was detected in either one of the set of the detection regions, the control means causes the object detector to it starts scanning those for the other~~

detection regions needed to ~~required for~~ narrowing down the bearing. ~~in which the object exists.~~

Claim 7 (currently amended): The object detector according to ~~any one of~~ claim[[s]] 1, further comprising:

setting means which can set one or more bearings of bearings which can be specified by the bearing specifying means, as a bearing to be detected;[[,]]

wherein setting means operates the control means to cause the object detector to scan[[s]] only the detection regions required for narrowing down the bearing. ~~to be detected, which was set by the setting means, among the predetermined plural detection regions.~~

Claim 8 (currently amended): The object detector according to ~~any one of~~ claim[[s]] 1, wherein the antenna is a phased array antenna comprising:

a plurality of antenna elements and phase shifters;

wherein ~~and the~~ control means switches a beam width by varying the number of antenna elements being ~~to be~~ fed, or switching a beam direction by controlling a feeding phase of the phase shifter.

Claim 9 (currently amended): The object detector according to claim 8, comprising:

an amplifier respectively provided for each ~~every~~ antenna element for ~~and~~ varying a feeding power to the respective antenna elements based ~~depending~~ on the number of the antenna elements being ~~to be~~ fed.

Claim 10 (currently amended): The object detector according to claim 8, further comprising:

a power distributor for distributing a power to the plural antenna elements; and

an amplifier varying a power to be supplied to the power distributor depending on the number of antenna elements to be fed.

Claim 11 (currently amended): An object detecting method of detecting an object with an antenna irradiating an electric wave to a detection region and receiving its echo comprising:

a step of switching a beam width and/or a beam direction of the antenna and scanning a plurality of detection regions such that one of the detection regions overlaps at least another one ~~any one of them~~; the plurality of detection regions;

a step of detecting whether a detection object exists in each one of the detection regions ~~or not~~ based on the received echo; and

a step of narrowing down a bearing in which the detection object exists based on detection results of the plural detection regions.

Claim 12 (currently amended): The object detecting method according to claim 11, further comprising:

a step of narrowing down a bearing in which the detection object exists based on both detection results of the detection regions where the object was detected, and the detection results of the detection regions in which the object was not detected.

Claim 13 (currently amended): The object detecting method according to claim 12, further comprising:

a step of specifying a region provided by excluding a region corresponding to sum of sets of the detection regions where the object was not detected, from a region corresponding to product set of the detection regions where the object was detected, as a bearing in which the detection object exists.

Claim 14 (currently amended): The object detecting method according to claim 13, further comprising:

a step of assigning a logical value based on ~~treating information~~ whether the detection object exists in the detection region; ~~or not with a logical value~~, and

calculating ~~calculates~~ the bearing region provided by excluding the region corresponding to the sum of sets of the detection region where the object was not detected, from the region corresponding to the product set of the detection regions where the object was detected, using logical operations.

Claim 15 (currently amended): The object detecting method according to ~~any one of~~ claim[[s]] 11, further comprising:

a step of specifying the bearing in which the object exists, after detection results are obtained from ~~referring to the predetermined plural~~ detection regions.

Claim 16 (currently amended): The object detecting method according to ~~any one of~~ claim[[s]] 11, further comprising:

a step of repeating scanning for a set of detection regions by which the whole regions corresponding to the sum of sets of all detection regions can be scanned with the least number of scanning, among the ~~predetermined plural~~ detection regions; and

when the object is ~~was~~ detected, ~~in either one of the set of the detection regions~~, starting scanning for the other detection regions required for narrowing down the bearing in which the object exists.

Claim 17 (currently amended): The object detecting method according to ~~any one of~~ claim[[s]] 11, wherein said ~~comprising~~ a step of scanning only scans the detection regions required for narrowing down the bearing to be detected[[,]] among the ~~predetermined plural~~ detection regions. [[,]] ~~in a case where one or more bearings are set as the bearing to be detected among the specifiable bearings.~~